


COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE(if not in response to a program announcement/solicitation enter NSF 11-1					FOR NSF USE ONLY	
NSF 12-529 08/14/12					NSF PROPOSAL NUMBER	
FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)						
DUE - S-STEM: SCHLR SCI TECH ENG&MATH						
DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION	
08/14/2012	1	11040000 DUE	1536	069418598	11/01/2017 4:39pm S	
EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)		SHOW PREVIOUS AWARD NO. IF THIS IS <input type="checkbox"/> A RENEWAL <input type="checkbox"/> AN ACCOMPLISHMENT-BASED RENEWAL		IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, LIST ACRONYM(S)		
856000545						
NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE			ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE			
Northern New Mexico College			Northern New Mexico College			
AWARDEE ORGANIZATION CODE (IF KNOWN)			921 Paseo de Onate			
0002378000			Espanola, NM. 875322649			
NAME OF PRIMARY PLACE OF PERF			ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE			
Northern New Mexico College			Northern New Mexico College			
			921 Paseo de Onate			
			Espanola ,NM ,875322649 ,US.			
IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)						
<input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> MINORITY BUSINESS <input type="checkbox"/> IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE						
<input type="checkbox"/> FOR-PROFIT ORGANIZATION <input type="checkbox"/> WOMAN-OWNED BUSINESS						
TITLE OF PROPOSED PROJECT PEARL - Pathways for Engineering: Access to Resources for Learning						
REQUESTED AMOUNT		PROPOSED DURATION (1-60 MONTHS)		REQUESTED STARTING DATE		
\$ 599,841		60 months		08/01/13		
SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE						
CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW						
<input type="checkbox"/> BEGINNING INVESTIGATOR (GPG I.G.2)						
<input type="checkbox"/> DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C.1.e)						
<input type="checkbox"/> PROPRIETARY & PRIVILEGED INFORMATION (GPG I.D, II.C.1.d)						
<input type="checkbox"/> HISTORIC PLACES (GPG II.C.2.j)						
<input type="checkbox"/> EAGER* (GPG II.D.2) <input type="checkbox"/> RAPID** (GPG II.D.1)						
<input type="checkbox"/> VERTEBRATE ANIMALS (GPG II.D.6) IACUC App. Date _____						
PHS Animal Welfare Assurance Number _____						
PI/PD DEPARTMENT			PI/PD POSTAL ADDRESS			
Engineering			921 Paseo de Onate			
PI/PD FAX NUMBER			Espanola, NM 875322649			
505-747-2180			United States			
NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Electronic Mail Address		
PI/PD NAME						
CO-PI/PD						
CO-PI/PD						
CO-PI/PD						
CO-PI/PD						

CERTIFICATION PAGE

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the Authorized Organizational Representative or Individual Applicant is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, lobbying activities (see below), responsible conduct of research, nondiscrimination, and flood hazard insurance (when applicable) as set forth in the NSF Proposal & Award Policies & Procedures Guide, Part I: the Grant Proposal Guide (GPG) (NSF 11-1). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

Conflict of Interest Certification

In addition, if the applicant institution employs more than fifty persons, by electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.A; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Drug Free Work Place Certification

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Exhibit II-3 of the Grant Proposal Guide.

Debarment and Suspension Certification

(If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency?

Yes ☐

No ☒

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Debarment and Suspension Certification contained in Exhibit II-4 of the Grant Proposal Guide.

Certification Regarding Lobbying

The following certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding \$100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Certification Regarding Nondiscrimination

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative is providing the Certification Regarding Nondiscrimination contained in Exhibit II-6 of the Grant Proposal Guide.

Certification Regarding Flood Hazard Insurance

Two sections of the National Flood Insurance Act of 1968 (42 USC §4012a and §4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards unless the:

- (1) community in which that area is located participates in the national flood insurance program; and
- (2) building (and any related equipment) is covered by adequate flood insurance.

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations:

- (1) for NSF grants for the construction of a building or facility, regardless of the dollar amount of the grant; and
- (2) for other NSF Grants when more than \$25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

Certification Regarding Responsible Conduct of Research (RCR)

(This certification is not applicable to proposals for conferences, symposia, and workshops.)

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative of the applicant institution is certifying that, in accordance with the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.B., the institution has a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students and postdoctoral researchers who will be supported by NSF to conduct research.

The undersigned shall require that the language of this certification be included in any award documents for all subawards at all tiers.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE		SIGNATURE	DATE
NAME [REDACTED]		Electronic Signature	Aug 14 2012 5:10PM
TELEPHONE NUMBER [REDACTED]	ELECTRONIC MAIL ADDRESS [REDACTED]		FAX NUMBER 505-747-2180

* EAGER - EARLY-concept Grants for Exploratory Research

** RAPID - Grants for Rapid Response Research

NATIONAL SCIENCE FOUNDATION
Division of Undergraduate Education

NSF FORM 1295: PROJECT DATA FORM

The instructions and codes to be used in completing this form are provided in Appendix II.

1. **Program-track** to which the Proposal is submitted: S-STEM:SCHLR SCI TECH ENG&MATH
2. Name of **Principal Investigator/Project Director** (as shown on the Cover Sheet):
[REDACTED]
3. Name of submitting **Institution** (as shown on Cover Sheet):
Northern New Mexico College
4. **Other Institutions** involved in the project's operation:

Project Data:

- A. Major Discipline Code: 58
- B. Academic Focus Level of Project: BO
- C. Highest Degree Code: B
- D. Category Code:
- E. Business/Industry Participation Code: NA
- F. Audience Code: WMD S F
- G. Institution Code: PUBL
- H. Strategic Area Code: IT
- I. Project Features: 2 3 4

Estimated number in each of the following categories to be directly affected by the activities of the project during its operation:

- J. Undergraduate Students: 40
- K. Pre-college Students: 0
- L. College Faculty: 5
- M. Pre-college Teachers: 0
- N. Graduate Students: 0

PROJECT SUMMARY

PEARL - Pathways for Engineering: Access to Resources for Learning

PEARL is a project of Northern New Mexico College (NNMC), which seeks to provide scholarships to full-time, academically talented, mostly underrepresented minorities majoring in Engineering, and who demonstrate financial need. Long-term project goals include:

1. Improving STEM educational opportunities for women and minorities in northern NM;
2. Increasing retention rates of NNMC STEM students;
3. Providing enhanced student support to ensure retention/student success;
4. Increasing the number of students graduating with STEM degrees;
5. Increasing the number of students entering a STEM graduate program or obtaining employment in a STEM-related field.

Project funding would provide for a minimum of 190 one-semester scholarships awarded to at least 40 qualified, full-time engineering students who are part of a cohort. Three types of scholarships will be offered to academically promising students who demonstrate financial need: 1) Tuition Scholarships; 2) Living Support Scholarships; and 3) Hybrid Scholarships. The objectives of this program are to:

- ? Enhance the recruitment of full-time students into the three existing Engineering baccalaureate programs;
- ? Provide financial resources to enable students to focus on their education and career;
- ? Monitor each supported-student's progress to ensure his/her completion of degree requirements within a reasonable timeframe;
- ? Encourage students to pursue graduate studies in STEM fields, or obtain employment in local industry, including the nearby Los Alamos National Laboratory;
- ? Promote research opportunities in campus research programs including Solar Energy Research Park and Academy initiative (SERPA); and NNMC Cisco Networking Academy.

Intellectual Merit

The proposed project is important to advancing knowledge and understanding of engineering in this impoverished, rural region, home to one of only three national research laboratories in the nation, Los Alamos National Labs. In 2011, the NNMC student demographic consisted of 83% Hispanics; 11% Native and African Americans; 80% first generation college students; with 83% qualifying for financial aid. Intellectual merit in this project derives from the knowledge, research skills, professional preparedness and Engineering Degree students will obtain. This will make possible options such as graduate studies or a professional career in STEM fields. Enabled through scholarships, this project has the capacity to transform the lives of students by providing them an academic pipeline through college-level work and to graduate studies; a variety of STEM-focused programs on campus; continual support through advisement and mentorship; and job skills training and workforce development enhancement. Dr. Lopez, as Chair of the Engineering Department at NNMC, is highly qualified to conduct this project, both as a professor/researcher, and as a mentor/advisor to students. Students will have a wide variety of state-of-the-art technical and mentoring/tutoring resources available to support their academic success, further ensuring their retention and graduation.

Broader Impact

The broader impact of PEARL will be to increase the number of Hispanic and Native American students with STEM educational and career opportunities otherwise unavailable to them. With financial assistance, scholarship recipients can focus on their studies, earn a Bachelor's Degree in Engineering, improve their living standards, and contribute to society and the local

PROJECT SUMMARY

economy. PEARL also offers students opportunities to grow intellectually, professionally, and socially.

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Project Description (Including Results from Prior NSF Support) (not to exceed 15 pages) (Exceed only if allowed by a specific program announcement/solicitation or if approved in advance by the appropriate NSF Assistant Director or designee)	15	
References Cited	1	
Biographical Sketches (Not to exceed 2 pages each)	6	
Budget (Plus up to 3 pages of budget justification)	8	
Current and Pending Support	3	
Facilities, Equipment and Other Resources	3	
Special Information/Supplementary Documents (Data Management Plan, Mentoring Plan and Other Supplementary Documents)	8	
Appendix (List below.) (Include only if allowed by a specific program announcement/ solicitation or if approved in advance by the appropriate NSF Assistant Director or designee)		
Appendix Items:		

*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

Northern New Mexico College (NNMC) has a total enrollment of 1,824 students. Before taking the initial step toward declaring a degree, most of these students have faced, and overcome, significant barriers and adversity. A typical NNMC student's family household has an average income of \$18,017, and lives in a rural area with 10.2% unemployment (REDI, 2009). Most (83%) qualify for financial aid and 80% are first generation college students. Few role models exist for these students in their pursuit of a college degree, and often family members fail to grasp their child's potential or their need to dedicate time to prepare for classes. As a result, many students must steal time to study and defy the embedded resistance to a higher education. Most students (66%) are, out of necessity, employed in full-time or part-time jobs. NNMC has an unusually high percentage of minority students, including Hispanics (83%), Native American (9%) and females (66.3%). A third are single parents, and susceptible to the parental pressures of providing child-care and fulfilling the responsibilities of single-parenting.

In this isolated region, men and women who aspire for college and who strive to transcend the boundaries of minimum wage and dead-end jobs, NNMC is a highly accessible way out, and a foundation for the way forward. The goal of NNMC is to provide quality education to the region's minority students, and improve their quality of life by equipping them with all of the tools they will need to excel at different levels. Scholarships provided through the PEARL program will allow recipients to pursue advanced degrees in Engineering, or find rewarding employment in research-oriented industries, which would not otherwise be possible.

The PEARL project is designed to fulfill the major goals of the S-STEM program. By providing students with the opportunity to obtain a Bachelor's degree in Engineering, and strongly encouraging and mentoring students to continue their education beyond the baccalaureate degree, this project will help to fulfill a major goal of the S-STEM program, i.e. to improve the educational opportunities for STEM students. By increasing the retention rate of our students and ensuring that students complete the degree requirements in a reasonable timeframe, this project will fulfill a second major goal of S-STEM, i.e. to increase the retention of students to degree achievement. By giving students an opportunity to become involved in research projects, offering tutoring and inviting established researchers to visit the programs, this project will fulfill the third major goal of S-STEM, i.e. improving student support programs at institutions of higher learning. Finally, by stimulating the critical thinking skills of students, engaging students in the process of scientific inquiry and maintaining the quality of the program, PEARL will fulfill the fourth major goal of S-STEM, i.e. to increase the numbers of well-educated and skilled employees in technical areas of national need.

A. Results from Prior NSF Support

RECENT NSF AWARDS TO NNMC – Math and Sciences

1035465 NNMC Phase 1-Noyce Scholarship Project ROBERT NOYCE SCHOLARSHIP
PGM10/01/10-09/30/15, [REDACTED] NM Northern New Mexico College \$1,152,055

0855059 Parallel Computing to Promote Research and Education Opportunities at Northern
New Mexico College CNS COMPUTING RES INFRASTRUCTURE 09/01/[REDACTED] NM
Northern New Mexico Community College Espanola \$150,913.00

0757088 Advancing STEM Performance, Innovation and Retention (ASPIRe) DUE STEM TALENT EXPANSN PGM (STEP) 06/15/2008 [REDACTED] NM Northern New Mexico College. Espanola Campus: \$499,252.00

This program is relevant to the current proposal. Students in the ASPIRe program who are performing with excellence will be candidates for scholarships under this proposal. Moreover, the PI for this proposal is the Co-PI for the ASPIRe grant, and the experiences gained will contribute to the scholarship of the PEARL project.

0806469 Biological Sciences S-STEM Project at NNMC DUE S-STEM: SCHLR SCI TECH ENG&MATH 08/01/2008 [REDACTED] NM Northern New Mexico College: \$598,000.00

This program is essential to this project, as best practices learned from it will be adopted.

B. Project Objectives and Plans:

Objective 1: Enhance educational opportunities of underrepresented minorities by focusing on the recruitment of full-time students from Northern New Mexico into one of two existing Engineering Baccalaureate programs at NNMC.

Plan: Recruitment efforts will include the following strategies:

1. Any first-year student who enrolls in an Introduction to Engineering (ENGR 110) course at NNMC, or a nearby two-year academic institution (Santa Fe Community College, University of New Mexico Los Alamos, University of New Mexico Taos), will be notified and encouraged to apply for a scholarship in the PEARL Engineering Program. The state of New Mexico has a transfer matrix developed for General Engineering. This will facilitate transfer of students into NNMC upon completion of their Pre-engineering studies in any state Community College.
2. The PI and members of the Steering Committee will visit all Developmental Math courses (Math 102, Math 130, Math 150, Math 155) at NNMC to discuss the Baccalaureate programs in Engineering and encourage students to choose Engineering as their major. Salary reports on different professions within the field, as well as exciting and diverse career paths and opportunities upon completion of the program, will be shared with students in order to provide incentives for them to study Engineering.
3. In addition, the PI and/or members of the Steering Committee will visit local high schools to speak with students enrolled in STEM courses and encourage them to attend NNMC and major in Engineering. At career fairs for local secondary students, the availability of state of the art facilities and excellent tutoring and mentoring programs at NNMC will be emphasized to attract prospective students.

Due to the financial need of the majority of students in this region, financial support offered through the PEARL scholarship program will greatly enhance recruitment efforts. Currently, demographics for Engineering students differ slightly from that of NNMC:

1. 101 total students;

2. 66% male and 34% female;
3. 73% Hispanic, 1% Native American, 26% other;
4. 80% are enrolled in Bachelor's, and 20% in an associates degree program;
5. 28 students graduated with a Bachelor of Engineering and 10 with an Associate's degree;
6. 72% of the students are full-time, while 28% are part-time (less than 12 credits).

Scholarship recipients will be required to pass the Introduction to Engineering course. Because this is a class that is taken only by Engineering students, the distribution of eligible students will be very similar to the demographics above. Since scholarships will be given based on academic merit and financial need, it is reasonable to assume that PEARL scholarships will impact Hispanic students heavily (as a result of student demographics for the region), thus eliminating the need for targeted recruitment strategies for this minority group.

Objective 2: Provide sufficient financial resources to enable students to focus on their education, complete their degrees, and prepare for a career or graduate studies.

Plan: Approximately 66% (1,637) of the students attending NNMC have full-time or part-time employment. This greatly limits the opportunity for students to complete a baccalaureate degree within a reasonable time frame. The provision of scholarships to students majoring in Engineering will greatly reduce the need for students to work, and will allow them time to focus on their courses. If funded, the PEARL project will provide three types of scholarships: a) Tuition Scholarship (TS), b) Living Support Scholarship (LSS), and c) Hybrid Scholarship (HS). The TS type of scholarship will directly cover the student's full time tuition at NNMC, which is currently \$1205.40 for 12 to 18 hours, plus \$155 in fees for a total semester cost of \$1360.

The considered Tuition Scholarship amounts will be sufficient to cover the tuition and fees of full time scholarship recipients enrolled in 15 credit hours or more. For less than 12 credits, the scholarship amount will be less than the total tuition. The rationale for this is to create an economic incentive for students to enroll in more than 14 credits each semester. In order to graduate within four years, a student must enroll in an average of 15-16 credits per semester. Generally, students prefer to enroll in only 12 credit hours because this is sufficient to obtain the full-time status. However, this decision typically delays graduation by one year.

The LLS scholarships consist of funding that will go directly to students for living expenses. The rationale for this scholarship is that several Engineering students already have Lottery Scholarships from the state of NM, which covers tuition, but they still need to work to pay for their living. This scholarship will prevent students from having to work, providing time to focus on their studies. The funding will be given to student in five monthly installments.

Finally, the HS scholarship is the most complete scholarship, as it combines both the TS and the LSS. This scholarship will target the students with the most financial need. Up to \$2180 per semester will be paid directly to NNMC to cover tuition and fees, and the remainder will be given to the students. Table 1 summarizes this information:

Number of Enrolled Credits per SEMESTER	Total per SEMESTER for LSS	Total per SEMESTER for HS
12	\$1200	\$2400

13	\$1290	\$2580
14	\$1380	\$2760
15	\$1810	\$3620
16	\$1920	\$3840
17	\$2030	\$4060
18	\$2180	\$4360

Table 1

For the duration of the grant, the allocation of scholarships per semester is shown in Table 2. This allocation allows for providing some scholarships immediately in the first semester, while reserving monies in the budget for new scholarships in subsequent semesters. This is important because the first scholarships will generate enthusiasm among students. Scholarship recipients will be eligible to renew their scholarships for a total of eight semesters of support.

	Year 1		Year 2		Year 3		Year 4		Year 5		Total per Type
Scholarship Type	Fal 13	Spr 14	Fall 14	Spr. 15	Fall 15	Spr. 16	Fall 16	Spr. 17	Fall 17	Spr. 18	
TS	4	5	6	6	6	6	6	6	4	4	53
LSS	6	8	9	9	9	9	9	9	7	5	82
HS	3	5	6	6	6	6	6	6	4	4	52
Total per year	13	18	21	21	21	21	21	21	15	15	187

Table 2

Table 2 provides a low estimate of the amount of scholarships per type. Some students will receive less funding (according to the number of credits) and the residual funding will help to provide additional scholarships or partial scholarships (case by case) to other applicants. A quick estimate from this data is that in the worst case (i.e, assuming that students get the maximum on each scholarship type and they keep the scholarship for the maximum of eight semesters), at least forty **different** students will be awarded one-semester scholarships in the life of the grant. Using the same demographics and population statistics presented above, another quick estimate is that recipients will be distributed as: twenty-six males, fourteen females and twenty-eight will be Hispanic students.

For a student receiving a 12-credit HS scholarship for example, at \$7.50 per hour, the amount equates to approximately 320 working hours (20 hr/week for 16 weeks). The median household income in Espanola is \$33,867. Therefore, a one-year HS scholarship of \$8,720 is 25% of that household income. For a NNM student, receiving a scholarship will make a difference in their degree pursuit, and will unquestionably impact quality of life while pursuing the degree.

Full-time students may apply in June for Fall scholarships and in October for Spring scholarships. Students who have been supported by these scholarships must re-apply each semester, but their re-application requires only an update of their GPA, and for them to

demonstrate progress towards their degree. As a result, NNMC will sponsor the most qualified students. By meeting this objective, NNMC will impact the lives of scholarship recipients.

Objective 3: Increase the retention rate at NNMC and monitor each supported student's progress to ensure their completion of degree requirements within a reasonable time-frame.

Plan: Northern New Mexico College offers two four-year baccalaureate programs: Engineering: Information Engineering Technology and Mechanical Engineering (with Solar Energy Concentration). In 2005, the college sought and obtained accreditation for the baccalaureate degree in Information Technology. In 2008, Northern sought and obtained accreditation for the Bachelor's degree in Mechanical Engineering (Solar Energy Technology).

Supported students must enroll in one of these two programs. In the first year of these programs at NNMC, 110 students declared Engineering as their major (including both Associates and Bachelor Degrees). Considering the number of students who have joined the program in the last several years (twelve *per program* per year), NNMC anticipates a net increase of fourteen students per year for the next four years, (after considering dropouts and graduation), or approximately 160 students by the year 2016.

Each entering student is assigned an academic advisor who is a faculty member in the Engineering Program. The advisors are responsible for meeting with an assigned student at least once per semester. Scholarship recipients will be required to meet with their advisors at least three times per semester. This will ensure that students take the appropriate courses, attain the degree requirements within a reasonable timeframe and promptly address any questions or issues of concern. The goal is to guarantee that each student successfully completes all the credits towards an engineering degree each semester. This will greatly increase student retention, as progress towards earning the degree will be realized much faster, thereby creating enthusiasm among scholarship recipients to compete the program.

The three baccalaureate curricula are included in section 5.b of this proposal. Scholarships will be offered only to full-time students who maintain a minimum 2.5 grade point average. By meeting this objective, NNMC will strengthen the intellectual merit of the project.

Objective 4: Encourage students to graduate and continue their education in graduate school, or obtain employment in local industry, such as the nearby LANL.

Plan: Within Northern New Mexico, only 19.5% of the population has obtained a bachelor's degree or higher. Through the proposed scholarships, NNMC will increase this percentage by offering the *only* two engineering baccalaureate programs in north central New Mexico. Students will be encouraged at multiple stages to continue their education beyond the baccalaureate degree. As part of this project, faculty will be available to assist and support scholarship recipients in preparing for the GRE and filling out graduate school applications and supporting materials. Additionally, annual visits to the main research universities mentioned above will be planned for the scholarship recipients who are near graduation, in an attempt to further encourage them to pursue graduate study.

The PI, Dr. Ivan Lopez, is currently the Chairperson of the Department of Engineering, Director

of the AVANCE grant (PPOHA-US Dept. of Ed.) and Director/Co-PI of the ASPIRe program (NSF-STEP grant). In addition, he has two years of experience managing the Mechatronics Baccalaureate Program at Tech de Monterrey, Juarez, Mexico, and has more than ten years of teaching experience. Finally, he has four years of experience working in several industries related to automation, control systems and data processing for the oil industry. Thus, he is in a strong position to advise the students regarding their successful application to graduate school or industry-related employment. The PI and Co-PIs will be actively engaged with senior students to facilitate submission of their applications.

Students under the scholarship program will be introduced to potential employers as well as coordinators of various engineering graduate programs in the state, including University of New Mexico, New Mexico Tech and New Mexico State University. The PI will then work with students individually to ensure that each application package, including personal statements, will be of sufficient quality to merit serious consideration at targeted schools.

The strategy for NNMC and the Engineering Department is to help students “market” themselves by collecting their resumes and sending them to various industrial advisory committee members of the two engineering programs.

Letters of support from local companies, the IT Department of the State of New Mexico, Alamos County, Los Alamos National Lab and others are included. In addition, letters of support are also included from the University of New Mexico and the New Mexico Mechanical Engineering Council expressing their interest in discussing graduate school with NNMC students.

Objective 5) Engage scholarship recipients in college activities and encouraging college service career options, such as teaching and research.

Plan: Junior and Senior scholarship recipients who choose to participate in college service activities will be encouraged to serve as tutors for incoming freshmen students in the STEM summer camps (sponsored by the NSF-STEP ASPIRe project). These activities will be on a volunteer basis; however, students will be compensated (from other funding sources) for their time. Service will be in the form of tutoring for the Math, Physics and Engineering courses.

Students will also be encouraged to get involved in undergraduate research projects sponsored by the SERPA initiative under the Department of Engineering during the summer. Similarly, IT students may become part of the Cisco Networking Academy, which focuses in two areas simultaneously: 1) job skills training and workforce development; and 2) research in multimedia networking, signaling and media protocols for 3G networks. The former refers to a hands-on experience with industrial networking equipment that enables career skill building.

The IT networking job market is one of the most dynamic areas nationwide and worldwide. The PEARL project is a pilot program resembling the Michigan Workforce Retraining Initiative [2], and the Social Retraining Center in Moscow [3]. The research area will focus on multimedia networking, where highly skilled workers are in demand locally and globally. At Los Alamos National Labs, quite proximal to NNMC, graduates fluent in research and development of advanced protocols such as 3G SIP, SDP, and RTP, are in demand [4].

The research and workforce development will be led by [REDACTED] in the IT field and by [REDACTED] on the Mechanical Engineering/Solar Energy field. [REDACTED] work has been published in international high-profile conferences. Recent work in wireless networking [6] has been selected among the three best papers out of 160+ in a world-wide recognized conference in wireless multimedia networking, namely, the 10th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks [5]. [REDACTED] is also the Director of the NNMC Cisco Networking Academy at NNMC.

These activities will contribute to the improvement of students' communications skills, will help to refresh background knowledge and keep them focused on their education. These activities will also contribute to enhancing their resumes. A portion of funds in the Student Services line item of the proposed budget is devoted to compensating the CO-PI's for the research activities they prepare and present to students during the summer. Other research activities will be sponsored by the Solar Energy Research Park and Academy (SERPA) project.

Curriculum Information for Engineering Majors: Table 3 contains the degree curriculum information from the programs eligible for scholarships. Only main areas are specifically identified; a total of 131-134 credits are required for graduation. Detailed information can be accessed at <http://engineering.nnmc.edu/page/bachelor-engineering-degrees>.

	Information Engineering Technology	Mechanical Engineering
General Education		
Communications	9	9
Mathematics	11	21
Laboratory Sciences	8	12
Social/Behavioral Sciences	6-9	6-9
Humanities and Fine Arts	6-9	6-9
Library Technology	1	1
Foreign Language	3	3
Major Requirements		
Computer Science	6	
Electrical, Electronic and Computer Engineering	37	
Information Technology	20	
Business/Industrial Engr.	9	9
Support Technologies	15	32
Solar Energy and Storage		32
TOTAL	131	134

Table 3

C. Significance of Project and Rationale

Founded in 1909 as the “Spanish American Normal School at El Rito,” Northern New Mexico College was designed to be, and has always been, a Hispanic Serving Institution. Its defined mission in the New Mexico Constitution was to educate bilingual teachers for northern New Mexico. Though hampered by chronic underfunding and inattention, NNMC has nevertheless continued to evolve – from a secondary boarding school to a vocational training school, to New Mexico’s first community college in 1977, and now to a Bachelor’s degree granting institution.

The College has always sought to effectively express the aspirations of this unique, tri-cultural, socio-economically challenged region. Over 80% of our students are Hispanic and 11% are Native American. Students have roots in small Hispanic villages, high in the Jemez and Sangre de Cristo Mountains, where descendants of 17th century Spanish settlers lived as small farmers and artisans. They also come from the eight northern Rio Grande Indian pueblos and the Jicarilla Apache reservation on the Colorado border, as well as the urban neighborhoods of Santa Fe, the state capital. The region is home not only to old Hispano families, but also to well-educated, wealthy immigrants from out-of-state, and first-generation immigrants from Mexico.

The Los Alamos National Labs, half an hour away from NNMC’s Espanola campus, creates a wealthy and highly educated enclave of scientists and researchers. The barriers of vast distances and mountainous geography that have for centuries held generations captive to the past have begun to erode and yield to modern technological advances. Today’s Northern student is as fluent in the use of electronics as any college student in Los Angeles. This fundamental social and cultural shift presents the college with both the challenge and opportunity to respond to the needs and interests of its students, as they become full participants in the global community.

The primary challenge for the college is to address poverty, the greatest barrier to college for students in this region. Eighty percent of all NNMC students qualify for financial aid and approximately the same percentage are first generation college students. Though 75% of the population completes high school, only 19% attain a Bachelor’s degree. The mission of NNMC is “to provide open access, affordable, quality educational opportunities in a modern technological environment by providing baccalaureate and associate degrees and certificate programs in liberal arts, career, workforce development and lifelong learning programs.”

The purpose of this request for funding is to make this mission statement a reality by offering scholarships to dedicated, qualified students in STEM programs. With both financial and institutional support, these students will be able to make their academic pursuits a priority and prepare themselves for a career in a rapidly growing field. This will improve their quality of life, the lives of their families, and, ultimately, the communities in which they live.

In January of 2007, the first baccalaureate program in Engineering began accepting students and offering the courses necessary for a Bachelor of Science degree in Information Technology. In spring 2009, a new Engineering baccalaureate degrees was incorporated, and the original BS in Information Technology was changed to BEng in Information Engineering Technology.

Scholarships from this grant will be limited to students enrolled in an Engineering Baccalaureate Program. Since January 2009, 110 students have enrolled in the two programs. Because these programs are the only engineering baccalaureate programs at a public college in Northern New Mexico, NNMC recruits transfer students from three regional, two-year institutions, including Santa Fe Community College, University of New Mexico Los Alamos, and University of New Mexico Taos. Currently these three institutions and NNMC are partners in a five-year collaborative STEM grant from US Department of Education. Through this grant, articulation agreements among the STEM programs, course sharing and joint development of courses is a new reality. The total enrollment of these three institutions is approximately 7,000 students (REDI). In addition, NNMC will recruit from high schools throughout the state.

Retention rates of students in the Engineering programs are 60% from fall to fall, which is about the national average. Data from the Institutional Effectiveness Office show that the first sixteen students who graduated in the engineering baccalaureate program at NNMC graduated in six years. These students started first with an associate degree or transferred from another college.

Another major goal of this project is to create the conditions whereby students are able to make their education a priority. This is another reason to assign more money to the scholarships for students enrolled in more credits. Awards will be determined only on the basis of the student's financial need and academic merit. Students who currently work part time and go to school either full time or part time will receive partial scholarships. Although adjustments may be necessary each year, depending on the financial needs of the students, we anticipate supporting approximately ten students with full scholarships and ten students with partial scholarships each year for four years. As more students declare Engineering as their major, and thus become eligible for scholarships, the competition for the scholarships will increase. Consequently, the most qualified students will be awarded the scholarships.

D. Activities on Which the Current Project Builds

Currently, several activities at NNMC will provide the synergy for a successful completion of this proposal. A brief description of the most important activities follows:

1. A current collaborative Title III US Department of Education STEM grant is providing funding to collaborative initiatives among NNMC, Santa Fe Community College, University of New Mexico-Taos, and University of New Mexico-Los Alamos. Some of the main initiatives include: a) the development of course transfer and articulation agreements among all STEM 2-year degrees and NNMC 4-year programs; b) common Summer STEM Bridge programs; and c) development and sharing of online courses. These initiatives simplify outreach efforts.
2. The ASPIRe (STEP-NSF-grant) project has been very successful in retention for the STEM degrees (including Engineering). A STEM Tutoring Center, sponsored by ASPIRE at the Department of Engineering, provides mentoring, tutoring, academic support and financial assistance for textbooks to the students. The retention rate is approximately 95% for the participating students. Study groups, learning communities and undergraduate teaching assistants working at the entry-level courses are core to ASPIRE, and are decreasing substantially the dropout rates in Engineering. Success stories from students demonstrate that

the financial resources in the form of student aid (even at the level of support for textbooks), have made a significant contribution to the student success rate in this community.

3. In August of 2008, the Biology Program at NNMC was awarded an S-STEM grant. The grant was received in the initial stages of the Biology baccalaureate program. The results of that funding include: a) an increase in enrollment and student-credit-hour generation for upper division courses; b) creation of research labs; c) a successful recruiting/selection process; and c) a shortened pathway to graduation for eleven Biology students. Of the twelve recipients of the S-STEM scholarship in the 2011-2012 academic cycle, five will graduate this year.

It is important to note that New Mexico State funding is proportional to course completion and graduation headcount generation, and the funding factor for completion for the upper division courses has nearly doubled in comparison to the factor for lower division courses (\$515 for upper division and \$313 for lower division). Therefore, the benefit of an S-STEM scholarship will be translated into more state funding for the Engineering program, and will help to expand the program infrastructure. The PEARL project will implement the best practices that were developed in the Biology program, where the enrollment has increased by 30% in the last year. This enrollment increase is highly correlated with availability of funding through S-STEM. However, a lesson learned from the current biology scholarship is that students in this region do not need \$10,000 per year, as the cost of living in this region is much lower. Many more students could benefit with less money, while still reaching the goal of allowing students to focus on their education rather than on working.

4. Currently the Department of Engineering at NNMC is implementing the "Introductory Math for Engineering Applications Model" that has been successfully implemented in 25 universities across the nation. This came about as a result of an NSF sponsored project developed by Wright State University. The model has improved retention dramatically in Engineering. The best practices of the model are now part of the engineering curriculum and contribute to the development of new engineering-math laboratories during the Summer. The \$40,000 in project funding is provided by a donation from Conoco-Philips to the Department of Engineering.

5. The final component contributing to the success of the S-STEM project is the research component through the Solar Energy Research Park and Academy (SERPA). This center started with a three million dollar grant from the state of New Mexico and will receive five million more for expansion. Students supported by scholarships will be encouraged to perform a research project or participate in an industrial internship. Other projects will be available through PNM (the largest electricity provider in NM) related to data analysis of PV collection.

Some external research funding from the PNM-Project will be used as an incentive to compensate students who choose to work on research projects during the summer. Students involved in research projects will present results to students in the ASPIRE seminars which are scheduled biweekly. They will then participate in the New Mexico Alliance for Minority Participation (AMP) Annual Conference at New Mexico State University in Las Cruces, NM. The AMP chapter at NNMC will sponsor the conference and provide travel expenses for the students. Students will gain valuable public speaking experience.

E. S-STEM Project Management Plan

The management team will consist of a PI (), Co-PI (), Co-PI () and a Steering Committee. Members of the Steering Committee will include NNMC Advising Staff, the Administrative Assistant to the Department of Engineering, (), Director of Financial Aid, (), Coordinator of the STEM Tutoring Center, () and the faculty of the Department of Engineering.

The faculty and advising staff on the Steering Committee will meet at midterm to evaluate each student's progress. Students in need of tutoring will be encouraged to use the services available through the STEM Tutoring Center and the campus Student Success Center.

In addition to the PI and Co-PIs, faculty members include () and (), who will both be involved in undergraduate research projects. The overall activities of the Steering Committee are illustrated in Figure 1.

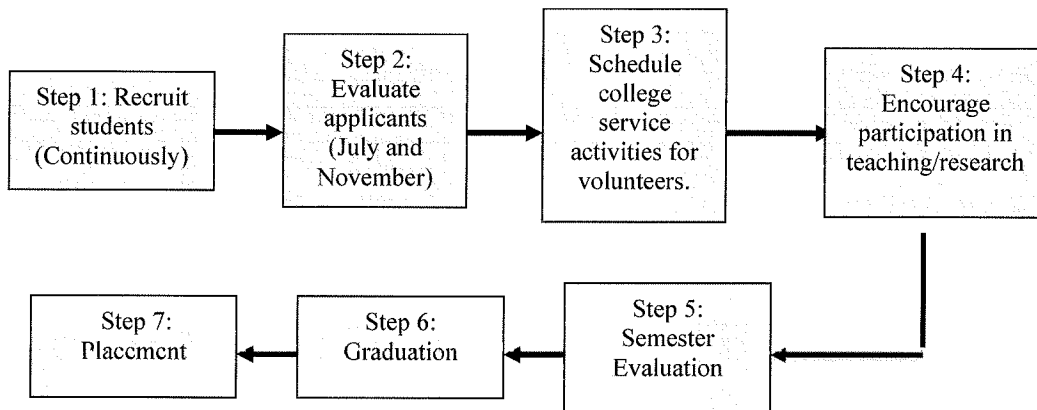


Figure 1

The first step is to recruit students into the PEARL project:

1. Materials will be mailed and emailed to all NNMC students who are currently enrolled in STEM courses, and to representatives of those departments at the regional two-year academic institutions who offer courses in engineering.
2. All engineering classes will be visited by the members of the Steering Committee and information about the scholarship will be presented to all students. Posters and flyers will be created every semester, and a web page for this scholarship will be added to the Departmental website. The website will include application forms, instructions and success stories from former awardees or S-STEM awardees from other institutions; and from NNMC students over time.
3. The main recruitment strategy will be the ENGR 110 Course (which is a mandatory class for all engineering freshmen students). This class has built-in two learning communities (LC): one for Information Technology and one for Mechanical Engineering. The mentors of these LCs will market the scholarships during their sessions, and will help the Steering Committee during the selection process. Targeting this class will help to

develop cohorts of awardees.

Members of the Steering Committee will prepare information sessions that will be given during the already existing biweekly seminars sponsored by another current STEM project (ASPIRE) STEM, where pizzas and goodies are provided to students. Interested students are identified and later contacted personally by the PI.

Following spring/fall recruitment, the second step will take place: the Steering Committee will lead the applicant's evaluation process described later. For step three, all awardees will be invited to participate in volunteering activities: recruitment, tutoring, materials preparation, etc. It is a departmental policy and graduation requirement for all Engineering bachelor students to complete a minimum of 100-hrs of community/college service. Any time that the awardees volunteer for the above activities, it will be counted towards this requirement.

Step four encourages teaching and/or research experiences. A student may gain this experience during any year they receive scholarship funds. Students will work as undergraduate teaching/research assistants with the engineering faculty. A student who decides to participate will be compensated for their participation from other sources.

In step five, the Steering Committee will meet at the end of each semester to evaluate the performance of each student. As indicated below, students who do not meet the standards may forfeit the scholarship. In such an event, students will be recruited from the list of current applicants, or, if necessary, the committee will conduct an extended recruitment.

Step six and seven of the project will provide student's support through graduation, encouraging them to continue their education beyond the Bachelor's degree and expose them to the graduate opportunities available in New Mexico and beyond. Scholarship recipients who are near graduation will visit the main research regional universities, and the Steering Committee will assist scheduling interviews for the students. Interested students will be provided information about the general procedures for applications for such schools. As part of another AVANCE project at the college, awardees near graduation will be eligible to enroll in preparation courses for the GRE. Similarly, students deciding to join the job market will receive institutional support from career services and the Steering Committee, and their resumes will be forwarded to the members of the advisory group.

The PI, [REDACTED], will: organize the meetings of the Steering Committee, advise students who receive scholarships, interact with NSF (including submitting reports), and coordinate activities for students, tutoring, and other student services as needed. The Co-PIs, [REDACTED] and [REDACTED], will be members of the Steering Committee, will provide advisement, relevant data, and lead undergraduate research projects during the summer. [REDACTED] will collect the applications for the students, inform them of incomplete paperwork, contact students and faculty for meetings and events, post schedules for students' college service, track progress of students and keep minutes of the meetings. She will also maintain a database of all students and their academic records. Director of Financial Aid, [REDACTED] will provide input and evaluation in the financial evaluation of the applicants. Advisors will be available to provide advisement and other student support.

The Steering Committee will meet at least twice per semester to: 1) monitor the progress of each student; 2) recommend potential changes in mentorship; 3) evaluate new applicants for scholarships and currently-supported students for renewal of scholarships; 4) review recruitment efforts; and 5) ensure that students have adequate access to support services. Should any student fail to meet the scholarship criteria, the Steering Committee will promptly find a replacement student among the applicants.

F. Student Selection Process and Criteria

Eligibility for scholarships will be based on academic quality and financial need and will follow the selection process. All applicants must:

- Be United States citizens, permanent residents, nationals or refugees.
- Enroll as a full-time student and major in any of the two Engineering Programs.
- Complete a formal application through the financial aid department.
- Have completed successfully the courses: Introduction to Engineering and Introduction to Engineering for Math Applications (for ME students) or Computer Programming (for IT students).
- Provide written statements of his or her goals and objectives.
- Maintain a minimum 2.5 GPA and show progress towards degree attainment.
- Have not accumulated more than four final grades equal to C-, D, F or W (which are all failing grades or withdraw). Only courses in the Engineering program will be checked for this purpose, i.e., transfers from other programs or previous degrees do not count.

G. S-STEM Student Support Services and Programs

As indicated above, the project will expand on existing student support services, including tutoring through the Student Success Center and the Writing Center. As part of the student support services component of this application, we are requesting \$6,000 per year to provide tutoring opportunities for students in certain engineering courses such as Circuit Analysis, Differential Equations, Computer Programming, Computer Logic Design, Statics and Dynamics. In addition, we are requesting a total of \$1000 per year to provide travel expenses for graduating students to visit some of the research universities in the region (University of New Mexico, New Mexico Tech and New Mexico State University) and expenses related to the research presentation (to create marketing material for the scholarships, printer toner, paper, software). Extensive career counseling will be provided by the faculty on the Steering Committee. This career counseling effort would include directing students toward any relevant opportunities in the industry or in academia based on realistic student performance and inclination. Proper guidance and advisement will be provided to students regarding preparation of application and supporting materials and for any prospective interview.

H. Quality of Educational Program

NNMC is accredited by the Higher Learning Committee of the North Central Association of Colleges and Schools. NNMC is also an AQIP institution, with an extensive network of Process Improvement Teams. Currently, the Department of Engineering is compiling a Self-Review for ABET accreditation; a visit from this agency will be scheduled Fall 2013 and a mock visit for this

Fall 2012. Currently, the Information Engineering Technology Baccalaureate Program offers a pathway for the CCNA (Cisco) Certification and the Department is member of the Cisco Academy. 100% of the twenty-eight graduates have been placed in the job market: nineteen are currently working at Los Alamos National Labs, well known for high recruitment standards.

It is clear that ABET accreditation is imperative for demonstrating the quality of an Engineering program. In the case of NNMC, the current lack of ABET accreditation has not been a matter of program quality, rather a matter of time (only in fourth year). However, the few alumni have shown the expected skills after graduation, both in the job market and in graduate school. All the letters of support attached to this proposal speak to this.

I. Assessment and Evaluation

As indicated above, the Steering Committee will evaluate each supported student twice each semester, and make appropriate recommendations to the student. A database of all supported students and their academic progress will be maintained by the PI, and the information will be provided to NSF as required. As explained above, the scholarships will play a significant role in the growth of the engineering programs at NNMC. Through the recruitment efforts of the Steering Committee and the targeted students at NNMC, Santa Fe Community College, the University of New Mexico branch at Los Alamos, the University of New Mexico branch at Taos, and regional high schools, we expect a net increase in the number of students in the Engineering Program of at least 14 students each year for the next four years. The increased enrollment will facilitate NNMC's long-term goal to become a university, and will provide a pipeline to the Department of Engineering Post-baccalaureate Certificate.

The effectiveness of this program will be measured using the following outcomes and targets:

- 1) Increase the degree progress rate; this means that the scholarship recipients will successfully complete a minimum of 12 credit hours (towards the degree) per semester.
- 2) Increase the overall GPA of the student recipients; the target will be a 3.5 average for the cohort. Note: the GPA of 3.5 is a desirable target but is not the factor that will determine the scholarship continuation for a recipient.
- 3) Increase the number of students involved in undergraduate research projects at the Department of Engineering. The target will be to involve 10 scholarship recipients in research per semester during the first year and ten students in at least one research project per year from the second year to graduation. This is a realistic target for a volunteer activity.
- 4) Increase job opportunities for scholarship recipients. The target will guarantee that 90% of scholarship recipients either participate in a summer industrial internship, receive a job offer in the first four months after graduation, or enroll in graduate school.

PIs and Co-PIs will gather data which will be summarized and reported in the PEARL website. Data will be gathered every year and used to develop action and improvement plans for the following years. A database will also be kept to allow longitudinal tracking of student success. These student success stories would have a broad long-term positive impact on the enrollment and retention of students, which is one of the major goals of this project.

The process will be data driven and the Steering Committee will collaborate with [REDACTED], Director of Assessment at NNMC, to evaluate the entire project. At the end of the project, the Steering Committee will meet to assess the entire program and will solicit input from faculty and administrators at NNMC.

Another important component of the assessment process is the organization of an annual meeting with all the awardees. The meeting will be in the form of a focus group interview. Feedback will be collected in the meeting and it will be used to improve the student services offered, as well as all the processes for scholarship assignment and recruitment. An invitation to the meeting will also be extended to some members of the advisory groups for the bachelor programs and faculty from the surrounding graduate schools. This will help to showcase the recipients of the scholarships, internships and graduate school. It will also help students to build their own network of professional contacts.

J. Dissemination Plans

The project will definitely become a source of learned experiences for faculty, students and the local community. It is very important to enable others to follow the best practices learned from this project. A number of different, low-cost strategies are listed:

1. Learning experiences from PEARL will be summarized, published and presented at the American Society of Engineering Education Annual conference (a minimum of 2 papers during the grant period) by the PI or Co-PIs.
2. The Department of Engineering will present partial and final results at the "Best Practices Conference" organized by the Alliance for Hispanic Serving Institute Educators: (<http://ahsie.unm.edu/ahsie-home/index.html>)
3. A PEARL project website will be built. The website will help to promote the scholarships among students and will also include data, analysis, success stories, published papers and lessons learned for use by the general public.
4. Poster presentation and information table at the NNMC Foundation Dinner. This event is attended by many of the current scholarship donors and through this presentation, donors will know about the successes and best practices and, perhaps, will be motivated to provide additional scholarship funding for engineering students.

REFERENCES CITED

[1] REDI-Regional Economic Development Strategic Plan, February, 2009; Regional Development Corporation.

[2] <https://portal.workforceretrainingus.com/web/michigan>

[3] http://www.cisco.com/web/learning/netacad/success_stories/caseStudies/moscow.html

[4] <http://www.city-data.com/city/Espanola-New-Mexico.html>

[5] J. Crichigno, M. Y. Wu, J. Khoury, W. Shu, A Joint Routing and Scheduling Scheme for Wireless Networks with Multi-Packet Reception and Directional Antennas, 10th IEEE International Symposium WoWMoM 2009.

[6] New Mexico Higher Education Department. Helping Students Succeed.
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SUMMARY PROPOSAL BUDGET

YEAR 1

ORGANIZATION				FOR NSF USE ONLY		
Northern New Mexico College				PROPOSAL NO.	DURATION (months)	
					Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.		
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF Funded Person-months		Funds Requested By proposer
	CAL	ACAD	SUMR			Funds granted by NSF (if different)
1. [REDACTED]	0.00	0.33	0.33	[REDACTED]		
2. [REDACTED]	0.00	0.40	0.00	[REDACTED]		
3. [REDACTED]	0.00	0.40	0.00	[REDACTED]		
4.						
5.						
6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	0		
7. (3) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	1.13	0.33	8,935		
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
1. (0) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	0		
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	0		
3. (0) GRADUATE STUDENTS				0		
4. (0) UNDERGRADUATE STUDENTS				0		
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				0		
6. (0) OTHER				0		
TOTAL SALARIES AND WAGES (A + B)				8,935		
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				1,707		
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				10,642		
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.)						
TOTAL EQUIPMENT				0		
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				1,000		
2. INTERNATIONAL				0		
F. PARTICIPANT SUPPORT COSTS						
1. STIPENDS \$ 0						
2. TRAVEL 0						
3. SUBSISTENCE 0						
4. OTHER 0						
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS				0		
G. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES				2,000		
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				500		
3. CONSULTANT SERVICES				0		
4. COMPUTER SERVICES				0		
5. SUBAWARDS				0		
6. OTHER				85,220		
TOTAL OTHER DIRECT COSTS				87,720		
H. TOTAL DIRECT COSTS (A THROUGH G)				99,362		
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) (Rate: , Base:)						
TOTAL INDIRECT COSTS (F&A)				0		
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				99,362		
K. RESIDUAL FUNDS				0		
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				99,362		
M. COST SHARING PROPOSED LEVEL \$ 0				AGREED LEVEL IF DIFFERENT \$		
PI/PD NAME				FOR NSF USE ONLY		
[REDACTED]				INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*				Date Checked	Date Of Rate Sheet	Initials - ORG
[REDACTED]						

SUMMARY PROPOSAL BUDGET

YEAR 2

ORGANIZATION				FOR NSF USE ONLY			
Northern New Mexico College				PROPOSAL NO.		DURATION (months)	
						Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.			
A. SENIOR PERSONNEL: PI/PI, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF Funded Person-months		Funds Requested By proposer	Funds granted by NSF (if different)
				CAL	ACAD	SUMR	
1. [REDACTED]				0.00	0.33	0.33	[REDACTED]
2. [REDACTED]				0.00	0.40	0.00	[REDACTED]
3. [REDACTED]				0.00	0.40	0.00	[REDACTED]
4.							
5.							
6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)				0.00	0.00	0.00	0
7. (3) TOTAL SENIOR PERSONNEL (1 - 6)				0.00	1.13	0.33	9,159
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)							
1. (0) POST DOCTORAL SCHOLARS				0.00	0.00	0.00	0
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)				0.00	0.00	0.00	0
3. (0) GRADUATE STUDENTS							0
4. (0) UNDERGRADUATE STUDENTS							0
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)							0
6. (0) OTHER							0
TOTAL SALARIES AND WAGES (A + B)							9,159
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)							1,749
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)							10,908
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.)							
TOTAL EQUIPMENT							0
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)							1,000
2. INTERNATIONAL							0
F. PARTICIPANT SUPPORT COSTS							
1. STIPENDS \$ 0							
2. TRAVEL 0							
3. SUBSISTENCE 0							
4. OTHER 0							
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS							0
G. OTHER DIRECT COSTS							
1. MATERIALS AND SUPPLIES							1,000
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION							500
3. CONSULTANT SERVICES							0
4. COMPUTER SERVICES							0
5. SUBAWARDS							0
6. OTHER							117,920
TOTAL OTHER DIRECT COSTS							119,420
H. TOTAL DIRECT COSTS (A THROUGH G)							131,328
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) (Rate: , Base:)							
TOTAL INDIRECT COSTS (F&A)							0
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)							131,328
K. RESIDUAL FUNDS							0
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)							131,328
M. COST SHARING PROPOSED LEVEL \$ 0				AGREED LEVEL IF DIFFERENT \$			
PI/PD NAME [REDACTED]				FOR NSF USE ONLY			
ORG. REP. NAME* [REDACTED]				INDIRECT COST RATE VERIFICATION			
				Date Checked	Date Of Rate Sheet	Initials - ORG	

2 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY PROPOSAL BUDGET

YEAR 3

ORGANIZATION				FOR NSF USE ONLY		
Northern New Mexico College				PROPOSAL NO.	DURATION (months)	
					Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.		
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF Funded Person-months		Funds Requested By proposer
	CAL	ACAD	SUMR			Funds granted by NSF (if different)
1. [REDACTED]	0.00	0.33	0.33			
2. [REDACTED]	0.00	0.40	0.00			
3. [REDACTED]	0.00	0.40	0.00			
4.						
5.						
6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00		0	
7. (3) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	1.13	0.33		9,385	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
1. (0) POST DOCTORAL SCHOLARS	0.00	0.00	0.00		0	
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00		0	
3. (0) GRADUATE STUDENTS					0	
4. (0) UNDERGRADUATE STUDENTS					0	
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)					0	
6. (0) OTHER					0	
TOTAL SALARIES AND WAGES (A + B)					9,385	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)					1,792	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)					11,177	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.)						
TOTAL EQUIPMENT					0	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)					4,200	
2. INTERNATIONAL					0	
F. PARTICIPANT SUPPORT COSTS						
1. STIPENDS \$		0				
2. TRAVEL		0				
3. SUBSISTENCE		0				
4. OTHER		0				
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS					0	
G. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES					2,000	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION					500	
3. CONSULTANT SERVICES					0	
4. COMPUTER SERVICES					0	
5. SUBAWARDS					0	
6. OTHER					117,920	
TOTAL OTHER DIRECT COSTS					120,420	
H. TOTAL DIRECT COSTS (A THROUGH G)					135,797	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) (Rate: , Base:)						
TOTAL INDIRECT COSTS (F&A)					0	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)					135,797	
K. RESIDUAL FUNDS					0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)					135,797	
M. COST SHARING PROPOSED LEVEL \$ 0				AGREED LEVEL IF DIFFERENT \$		
PI/PD NAME [REDACTED]				FOR NSF USE ONLY		
ORG. REP. NAME*				INDIRECT COST RATE VERIFICATION		
				Date Checked	Date Of Rate Sheet	Initials - ORG

3 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY PROPOSAL BUDGET

YEAR 4

ORGANIZATION Northern New Mexico College				FOR NSF USE ONLY			
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR [REDACTED]				PROPOSAL NO.	DURATION (months)		
				AWARD NO.	Proposed	Granted	
A. SENIOR PERSONNEL: PI/PI, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF Funded Person-months		Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR				
1. [REDACTED]	0.00	0.33	0.33				
2. [REDACTED]	0.00	0.40	0.00				
3. [REDACTED]	0.00	0.40	0.00				
4.							
5.							
6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00		0		
7. (3) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	1.13	0.33		9,618		
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)							
1. (0) POST DOCTORAL SCHOLARS	0.00	0.00	0.00		0		
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00		0		
3. (0) GRADUATE STUDENTS					0		
4. (0) UNDERGRADUATE STUDENTS					0		
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)					0		
6. (0) OTHER					0		
TOTAL SALARIES AND WAGES (A + B)					9,618		
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)					1,835		
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)					11,453		
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.)							
TOTAL EQUIPMENT					0		
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)					1,000		
2. INTERNATIONAL					0		
F. PARTICIPANT SUPPORT COSTS							
1. STIPENDS \$ _____			0				
2. TRAVEL _____			0				
3. SUBSISTENCE _____			0				
4. OTHER _____			0				
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS					0		
G. OTHER DIRECT COSTS							
1. MATERIALS AND SUPPLIES					1,000		
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION					500		
3. CONSULTANT SERVICES					0		
4. COMPUTER SERVICES					0		
5. SUBAWARDS					0		
6. OTHER					117,920		
TOTAL OTHER DIRECT COSTS					119,420		
H. TOTAL DIRECT COSTS (A THROUGH G)					131,873		
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) (Rate: , Base:)							
TOTAL INDIRECT COSTS (F&A)					0		
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)					131,873		
K. RESIDUAL FUNDS					0		
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)					131,873		
M. COST SHARING PROPOSED LEVEL \$ 0				AGREED LEVEL IF DIFFERENT \$			
PI/PI NAME [REDACTED]				FOR NSF USE ONLY			
ORG. REP. NAME* [REDACTED]				INDIRECT COST RATE VERIFICATION			
				Date Checked	Date Of Rate Sheet	Initials - ORG	

SUMMARY PROPOSAL BUDGET

YEAR 5

ORGANIZATION				FOR NSF USE ONLY		
Northern New Mexico College				PROPOSAL NO.	DURATION (months)	
					Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.		
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF Funded Person-months		Funds Requested By proposer
	CAL	ACAD	SUMR			Funds granted by NSF (if different)
1. [REDACTED]	0.00	0.33	0.33			
2. [REDACTED]	0.00	0.40	0.00			
3. [REDACTED]	0.00	0.40	0.00			
4.						
5.						
6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00		0	
7. (3) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	1.13	0.33		9,859	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
1. (0) POST DOCTORAL SCHOLARS	0.00	0.00	0.00		0	
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00		0	
3. (0) GRADUATE STUDENTS					0	
4. (0) UNDERGRADUATE STUDENTS					0	
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)					0	
6. (0) OTHER					0	
TOTAL SALARIES AND WAGES (A + B)					9,859	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)					1,882	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)					11,741	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.)						
TOTAL EQUIPMENT					0	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)					4,200	
2. INTERNATIONAL					0	
F. PARTICIPANT SUPPORT COSTS						
1. STIPENDS \$ 0						
2. TRAVEL 0						
3. SUBSISTENCE 0						
4. OTHER 0						
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS					0	
G. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES					1,000	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION					1,500	
3. CONSULTANT SERVICES					0	
4. COMPUTER SERVICES					0	
5. SUBAWARDS					0	
6. OTHER					83,040	
TOTAL OTHER DIRECT COSTS					85,540	
H. TOTAL DIRECT COSTS (A THROUGH G)					101,481	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) (Rate: , Base:)						
TOTAL INDIRECT COSTS (F&A)					0	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)					101,481	
K. RESIDUAL FUNDS					0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)					101,481	
M. COST SHARING PROPOSED LEVEL \$ 0				AGREED LEVEL IF DIFFERENT \$		
PI/PD NAME [REDACTED]				FOR NSF USE ONLY		
ORG. REP. NAME* [REDACTED]				INDIRECT COST RATE VERIFICATION		
		Date Checked		Date Of Rate Sheet		Initials - ORG

5 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY PROPOSAL BUDGET

Cumulative

ORGANIZATION Northern New Mexico College				FOR NSF USE ONLY	
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR [REDACTED]				PROPOSAL NO.	DURATION (months)
				Proposed	Granted
AWARD NO.					
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)			NSF Funded Person-months		Funds Requested By proposer
	CAL	ACAD	SUMR		Funds granted by NSF (if different)
1. [REDACTED]	0.00	1.65	1.65	[REDACTED]	
2. [REDACTED]	0.00	2.00	0.00	[REDACTED]	
3. [REDACTED]	0.00	2.00	0.00	[REDACTED]	
4.					
5.					
6. () OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	0	
7. (3) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	5.65	1.65	46,956	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (0) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	0	
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	0	
3. (0) GRADUATE STUDENTS				0	
4. (0) UNDERGRADUATE STUDENTS				0	
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				0	
6. (0) OTHER				0	
TOTAL SALARIES AND WAGES (A + B)				46,956	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				8,965	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				55,921	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.)					
TOTAL EQUIPMENT				0	
E. TRAVEL	1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)			11,400	
	2. INTERNATIONAL			0	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS \$	0				
2. TRAVEL	0				
3. SUBSISTENCE	0				
4. OTHER	0				
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS				0	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				7,000	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				3,500	
3. CONSULTANT SERVICES				0	
4. COMPUTER SERVICES				0	
5. SUBAWARDS				0	
6. OTHER				522,020	
TOTAL OTHER DIRECT COSTS				532,520	
H. TOTAL DIRECT COSTS (A THROUGH G)				599,841	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				0	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				599,841	
K. RESIDUAL FUNDS				0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				599,841	
M. COST SHARING PROPOSED LEVEL \$ 0			AGREED LEVEL IF DIFFERENT \$		
PI/PD NAME [REDACTED]			FOR NSF USE ONLY		
ORG. REP. NAME* [REDACTED]			INDIRECT COST RATE VERIFICATION		
			Date Checked	Date Of Rate Sheet	Initials - ORG

C *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

Budget Justification Page

The PEARL Project at Northern New Mexico College proposes four categories of cost:

(1) Direct student aid in the form of tuition-and-fees scholarships and additional cost-of-attendance assistance for the S-STEM Engineering cohort during 2013-2018.

(2) Administrative Support: Compensation for the Principal Investigator, [REDACTED] It includes an annual stipend and release time equivalent to one course per year.

(3) Support services for scholarship recipients. This will cover the release time equivalent to one course per year for each of the two Professor Co-PI's that will lead the research efforts. It also includes the material and dissemination cost in printing services, marketing materials such as flyers and posters, five conference registrations for results dissemination, office supplies for data keeping, etc.. Travel expenditures are also included in this line item.

(4) Promotional materials and dissemination costs; travel, supplies, annual meeting registrations.

Budget Details:

(1) Direct Student Aid: During each year of the Project, NSF funds will be used to provide a minimum of 190, one-semester scholarships to Engineering majors at NNMC, distributed over five years. Of those, a minimum of fifty-three scholarships are designated as Tuition Scholarships at a maximum of \$2,180.00 per semester; a minimum of eighty-two are designated as Living Support Scholarship at a maximum of \$2,180 per semester; and, a minimum of fifty-two scholarships are designated as Hybrid Scholarships. The numbers of scholarships of each type are estimated, since the scholarship amounts will be based upon financial need factors such as Expected Family Contribution, Unmet Need, and other financial aid received by the student, as well as the number of registered credits. All of these scholarships together total to \$521,020.00 (87% of the budget request).

(2) Administrative Support Cost: Over the course of the five-year project, the Principal Investigator, [REDACTED] will be responsible for: (a) project management and reporting, (b) advising S-STEM cohort students and referring them to a variety of on-campus student support resources and services, (c) monitoring the research/mentorship aspects of the project, and (d) convening the Steering Committee meetings. This level of effort requires a one-course release arrangement for the PI each academic year (\$2,070.00 + 19.1% for an adjunct instructor); and a partial summer salary of \$2,725.00 + 19.1% for the PI. A 2.5% increase per year is included. Over five years, these total to [REDACTED]. In person-month equivalency, this effort equals 0.66 month. This constitutes a total of \$30,013 (5% of the total budget).

(3) Student Support Costs: The Co-PIs will be members of the Steering Committee and lead the undergraduate research efforts. This level of effort requires a one-course release arrangement each academic year (\$2,070.00 + 19.1% for an adjunct instructor) for each Co-PI, assuming an increase of 2.5% per year. In person-month equivalency, this effort equals 0.4 month and constitutes a total of \$25,908 (4.2% of the total budget).

(4) Other Costs: Over the course of the five-year project, other costs will be incurred, including:

(a) Promotional materials and dissemination costs - will be required for printing services, marketing materials such as flyers and posters, five conference registrations for results

Budget Justification Page

dissemination, office supplies for data keeping, etc.. Years 1, 3 and 5 will require \$2,500 each while Years 2, and 4 will require \$1,500. The reason is that Year 1 will require more funding for promotional materials and Years 3 and 5 will require funding to cover additional registration costs for the conferences that will be attended.

(b) Travel expenses for students - funding will be necessary to cover travel expenses for students attending seminars/interviews at the universities in the region who offer graduate programs. Year 1, 2 and 4 require \$1,000 while Year 3 and 5 require \$4200 to cover the travel expenses for the conferences that will be attended for dissemination purposes.

(c) Annual meeting - will be held every year of the grant. All scholarship awardees and the Steering Committee will attend an informal lunch. The funding required is \$200 per each of five years.

The overall cost for these services is \$22,900 (3.8% of the entire budget).

FACILITIES, EQUIPMENT & OTHER RESOURCES

FACILITIES: Identify the facilities to be used at each performance site listed and, as appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Use "Other" to describe the facilities at any other performance sites listed and at sites for field studies. USE additional pages as necessary.

Laboratory: (1) Networking Lab (HT-118). This Lab is equipped with 22 PC desktop computers, network simulation equipment, Cisco routers and switches, networking cables, and equipment for VoIP. In this lab students perform packet analysis, deploy network services such as DNS, mail, web, and FTP.

Clinical:

Animal:

Computer: Other Computing Resources available to the PEARL program include a Computer on Wheels (COW) rack that is equipped with 20 Windows-based laptops that can be utilized on demand for any of the classes. These laptops can be loaned to the students if there is no class scheduled to

Office:

Other: A special feature of NNMC is the Student Success Center (<http://www.nnmc.edu/academics/resources/ssc/>). This center includes an extensive array of computers, self-paced computer tutorial programs, tutorial assistance, study groups, mentors, placement testing, study skill instruction, internet assistance and a video library. All of these

MAJOR EQUIPMENT: List the most important items available for this project and, as appropriate identifying the location and pertinent capabilities of each.

OTHER RESOURCES: Provide any information describing the other resources available for the project. Identify support services such as consultant, secretarial, machine shop, and electronics shop, and the extent to which they will be available for the project. Include an explanation of any consortium/contractual arrangements with other organizations.

Counselor - A full time counselor is available to students for all of their non-academic needs, including counseling in a variety of familial, emotional, psychological and financial services.

In addition, NNMC has job placement services, and full-time staff to work with students in their professional placement needs.

FACILITIES, EQUIPMENT & OTHER RESOURCES

Continuation Page:

LABORATORY FACILITIES (continued):

The devices available in this lab allow the students to design wired and wireless LANs and WANs. The lab is equipped with an eInstruction's smartboard. When used as a theoretical classroom, it provides seating for up to 32 students.

(2) Computer Programming Lab (HT-123). This Lab has 22 desktops with Linux and Windows Operating systems as well as open source IDE's for C and Java languages. MySQL DBMS is also available at this lab. The lab is equipped with an eInstruction's smartboard. When used as a theoretical classroom, it provides seating up to 36 students. It also has a rack with networking equipment.

(3) Software Engineering Lab (HT-126). This Lab has 18 Windows-based desktop PC's, four Dell Servers, Android devices, Apple mobile devices, MacBook laptops, as well as Bluetooth-based sensors that can be connected to the mobile devices. Students utilize the equipment in this lab to develop software applications that execute the mobile devices, distributed applications and information assurance.

(4) Instrumentation Lab (SERPA 115). It is comprised of 12 desktop PC computers, material for instrumentation (National Instruments ELVIS II equipment and other electronic components), and Xilinx Nexis II (SPARTAN 3) FPGA equipment.

COMPUTER FACILITIES (continued):

utilize such equipment during the day. In addition to the COW, the Department of Engineering has purchased, in support of the classroom activities, didactical kits such as Lego Mindstorms robot kits, Arduino UNO boards, MOBI clickers/tablets, and ELMO digital document cameras. An HP plotter, a high capacity photocopy/printer machine, and a color printer are also available for the program.

Students in the PEARL Program also have access to a small Hadoop cluster (located in HT-114), and an MPI-based 108 CPU cluster available through the Math Department (located in HT-124). The Department has also purchased 55 MATLAB licenses and has a departmental LabView license. Moreover, the Department is part of the Microsoft MSDN Academic Alliance and has access to Microsoft Software.

From their first semester in college, students, staff and faculty have access to the institutional email system outsourced through Google Apps for Education, which also has capabilities for streaming, cloud storage, social networking and computer literacy (e.g. text processing, spreadsheet) applications. The institutional e-mail system is the official means of electronic communication with students.

FACILITIES, EQUIPMENT & OTHER RESOURCES

Continuation Page:

COMPUTER FACILITIES (continued):

The NNMC community also has access to a Blackboard Learning System which is supported by the Distance Education Department. This department also provides support for distance education classrooms. Distance Ed. develops regular training workshops in the utilization of the Blackboard System for faculty and students, and also provides support in the development of online teaching classes and materials.

In addition to the Blackboard System, the College's IT infrastructure provides access and support to the Banner system that keeps final grading, financial, and transcript data for students. Recently, the College has acquired the DegreeWorks software which is a web-based system for academic advising and degree audit which will improve and expedite the advisement process with the students.

Computer Programming Lab (HT-123). This Lab has 22 desktops with Linux and Windows Operating systems as well as open source IDE's for C and Java languages. MySQL DBMS is also available at this lab. The lab is equipped with an instruction's smartboard. When used as a theoretical classroom, it provides seating up to 36 students. It also has a rack with networking equipment.

OTHER FACILITIES (continued):

services are free to all students.

In addition, the library at NNMC has access to two sets of databases for students to search scientific literature.

Engineering Tutoring Center (SERPA 117). This is a general purpose lab with 7 Desktop PCs where students have access to Internet and it also serves as a group learning environment. It also has whiteboards, printers and photocopy machines.

Data Management Plan

Since this is not a research project, it is not expected to generate high volumes of experimental data or metadata. However, for the purposes of dissemination, some relevant information will become available at a dedicated PEARL website. This information includes:

- Annual report, including demographics of scholarship recipients, academic programs per recipient, academic progress and retention statistics per recipient (in blind format) for the particular year, and description of recruitment practices.
- Compilation of success stories (with permission of recipients).
- Blank application materials.
- Conference papers published in ASEE Conference, the Best Practices Conference of the Alliance for Hispanic Serving Institute Educators and/or others.

Due to the nature of the project, we will not require special long-term storage facilities other than the web-server hosting of the PEARL website. The website will be kept for two years after the project end-date.

Other policies related to confidential information include the following:

- No personal student information (including name, email, address, phone or student ID) will become available in any form. In the case of success stories discussed above, names of students may be included only with written permission.
- Personal student information in electronic form will always be stored and backed up in encrypted files in local secure hard drives with no access to the public. Paper materials from the student applications will remain stored in the Department of Engineering Student Archives.